

Setting Up Direct Serial Links

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Project Title: Network Setup and Configuration

Enabling Serial Interfaces on R1 and R2

Objective: To enable and verify the Serial0/0 interfaces on Routers R1 and R2, with R2's Serial0/0 identified as the DCE (Data Communications Equipment) in our network topology.



```
Router2
Physical Config CLI Attributes
IOS Command Line Interface

Processor Board ID: F1A180682XU
4 FastEthernet interface(s)
1 Gigabit Ethernet interfaces
1 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 32 bits wide
255K bytes of non-volatile configuration memory.
999936K bytes of ATA System CompactFlash (Read/Write)

%CELLWAN-2-MODEM_UP: Modem in HWIC slot 0/0 is now UP
%CELLWAN-2-MODEM_NOT_ACTIVATED: Cellular0 modem has not been activated

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router2(config)#hostname Router2
Router2(config)#int Serial0
Router2(config-if)#no shut

Router2(config-if)#
%LINK-5-CHANGED: Interface Serial0, changed state to up

Router2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0,
changed state to up
```

In this part of the network setup, I initially accessed privileged EXEC mode by entering `Router>en` followed by `Router#config t` to enter global configuration mode. Here is the sequence of commands:

Changed the router's hostname from 'Router' to 'Router2' with `Router(config)#hostname Router2`.

Entered interface configuration mode for the Serial0 interface using `Router2(config)#int Serial0`.

Activated the Serial0 interface with `Router2(config-if)#no shut`.

The immediate feedback from the router after enabling the Serial0 interface was:

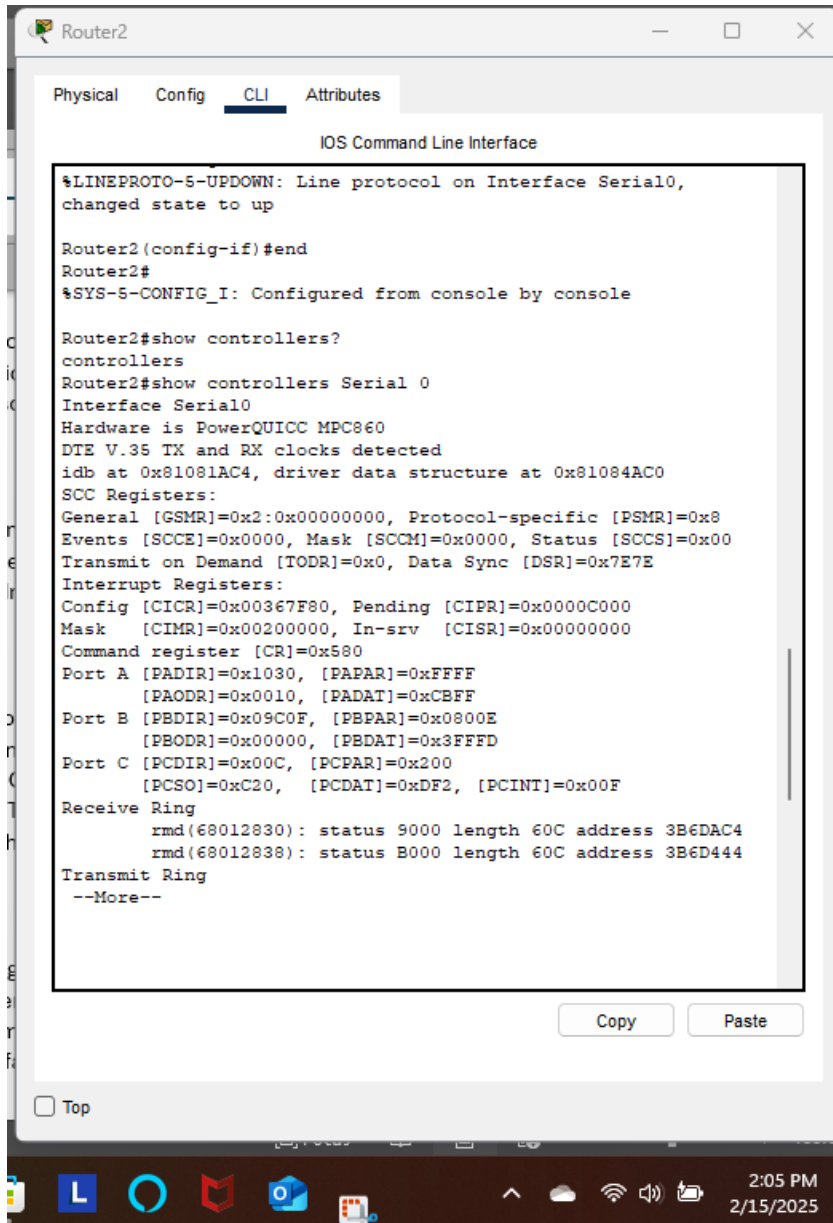
`%LINK-5-CHANGED: Interface Serial0, changed state to up`, indicating the physical link of the Serial0 interface was now active.

`%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0, changed state to up`, showing that the line protocol on the Serial0 interface has also transitioned to

an "up" state, meaning it's now operational at the data link layer.

These log messages confirm that the Serial0 interface on Router2 is now up and functioning, ready to transmit and receive data. This step ensures connectivity between routers or devices connected via this serial link, setting the stage for further network configuration or testing.

Project Documentation: Router2 Serial Interface Configuration



```
Router2
Physical Config CLI Attributes
IOS Command Line Interface

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0,
changed state to up

Router2(config-if)#end
Router2#
%SYS-5-CONFIG_I: Configured from console by console

Router2#show controllers?
controllers
Router2#show controllers Serial 0
Interface Serial0
Hardware is PowerQUICC MPC860
DTE V.35 TX and RX clocks detected
idb at 0x81081AC4, driver data structure at 0x81084AC0
SCC Registers:
General [GSMR]=0x2:0x00000000, Protocol-specific [PSMR]=0x8
Events [SCCE]=0x0000, Mask [SCCM]=0x0000, Status [SCCS]=0x00
Transmit on Demand [TODR]=0x0, Data Sync [DSR]=0x7E7E
Interrupt Registers:
Config [CICR]=0x00367F80, Pending [CIPR]=0x0000C000
Mask [CIMR]=0x00200000, In-srv [CISR]=0x00000000
Command register [CR]=0x580
Port A [PADIR]=0x1030, [PAPAR]=0xFFFF
[PADDR]=0x0010, [PADAT]=0xCBFF
Port B [PBDIR]=0x09C0F, [PBPAR]=0x0800E
[PBODR]=0x00000, [PBDAT]=0x3FFFD
Port C [PCDIR]=0x00C, [PCPAR]=0x200
[PCSO]=0xC20, [PCDAT]=0xDF2, [PCINT]=0x00F
Receive Ring
  rmd(68012830): status 9000 length 60C address 3B6DAC4
  rmd(68012838): status B000 length 60C address 3B6D444
Transmit Ring
--More--
```

In this phase of the network project, I executed the show controllers Serial0 command on Router2 to delve into the specifics of the Serial0 interface's configuration and operational status. This command output provides comprehensive details about the hardware and software settings of the Serial0 interface.

The interface is identified as using Power QUICC MPC860 hardware, operating in DTE mode with both TX and RX clocks detected, which ensures proper synchronization for serial data transmission. The Interface Descriptor Block (IDB) is located at memory address `0x81081AC4`, while the driver data structure is at `0x81084AC0`.

The Serial Communications Controller (SCC) registers' settings are crucial for the interface's functionality. The General and Protocol-specific

Mode Registers (`GSMR` and `PSMR`) are set to values that define the interface's behavior. Notably, the event registers (`SCCE`, `SCCM`, `SCCS`) show no active events or changes, and the Transmit on Demand (`TODR`) and Data Sync (`DSR`) registers are at zero and `0x7E7E`, respectively, which are part of the interface's control mechanism.

The interrupting handling configuration is also detailed, with the Config, Pending, Mask, and In-service registers (`CICR`, `CIPR`, `CIMR`, `CISR`) providing insights into how interrupts are managed. The Command register (`CR`) at `0x580` indicates specific operational commands.

Additionally, the port configurations for `Port A`, `Port B`, and `Port C` outline the interface's pin usage, which is essential for physical layer operations.

Finally, the command output includes a snapshot of the Receive and Transmit Ring buffers. This information shows the memory addresses and status of the buffer entries, which are fundamental for managing data packets moving through the interface. Understanding these buffer details helps in verifying that the data transmission and reception are correctly configured, ensuring robust and efficient serial communication in the network setup.

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